# **CURRENT LITERATURE**

## A REEXAMINATION OF PLEDS IN THE SETTING OF STATUS EPILEPTICUS

#### Serial EEG During Human Status Epilepticus: Evidence for PLED as an Ictal Pattern

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OBJECTIVE: To analyze the relationship between periodic lateralized epileptiform discharges (PLED) and status epilepticus (SE), to evaluate the relationship between mortality and periodic patterns, and to determine whether a stereotypic sequence of EEG patterns exists during human SE.

METHODS: The authors performed a prospective clinical and electrographic study comprising 62 episodes of SE, 55 patients, and 254 ictal/postictal EEG recordings. Serial daily EEG were obtained in all cases.

RESULTS: Partial SE was the predominant clinical type. Four distinct ictal EEG patterns were identified: intermittent EEG seizures (IES), merging EEG seizures (MES), continuous ictal discharges (CID), and periodic epileptiform discharges (PED) which could be lateralized (PLED) or bilateral (PBED). IES was the most common ictal pattern. In the same record, only one combination of ictal patterns was observed corresponding to an association of PLED or PBED and MES pattern. Serial EEG demonstrated that approximately one-third of SE resolved before the second EEG, another one-third persisted and maintained the same ictal pattern throughout the entire evolution, and the final one-third showed variable ictal EEG patterns. PLED were also unequivocally associated with epileptic seizures, and in some patients were the initial ictal pattern.

CONCLUSION: PLED can be an ictal pattern; and, in contrast to previous observations, no stereotyped sequence of ictal EEG patterns was found. PLED/PBED were not a terminal ictal pattern in every case, and outcome was more related to age and etiology than to specific ictal EEG patterns.

#### COMMENTARY

 ${f P}$ art of the difficulty in managing status epilepticus is in deciding what should be treated as a medical emergency. In addition to the traditional disagreement regarding the time frame justifying the moniker of "status," physicians have also debated the need to treat patients who manifest periodic lateralized epileptiform discharges (PLEDs) on their EEGs, especially when there is little clinical suspicion for seizure activity. Certainly, any slow rhythmic EEG pattern, including PLEDs, resolving with antitepileptic drugs (AEDs) can justifiably be characterized as ictal. Similar morphology PLEDs, which are AED-unresponsive, have traditionally been considered markers of abnormal brain function, but not immediately ictal in nature. In reporting a sequence of five EEG patterns of status epilepticus, Treiman (1) postulated that PLEDs were not only ictal but a late stage of this neurological emergency. To date, no human data has clearly supported PLEDs as a late element of status epilepticus. The current article, therefore, sought to define when PLEDs occurred in a group of patients followed with serial EEGs.

The methodology of this study was quite straightforward, with EEGs interpreted on a daily basis for a series of status epilepticus patients. The standard clinical World Health Organization definition of status epilepticus of 30 minutes was used, and all of Treiman's EEG patterns were considered as types of electrographic status epilepticus with the exception of those primarily showing periods of flattening. Thus, periodic lateralizing and bilateral discharges were considered as ictal by the investigators and were treated. Unfortunately, few details are given regarding actual treatment. It is unclear whether patients were on standard published protocols, continuous infusions, or whether they required intubation.

The investigators found no consistent evolution of EEG patterns to later PLEDs. In fact, a number of patients, including one who had several recurrences, had PLEDs as the initial pattern. As has been shown in numerous other studies, mortality was associated with age and etiology, and did not appear associated with an EEG morphology. Although this study is limited in that only patients with PLEDs in the setting of known status epilepticus were evaluated, the absence of any reproducible sequence supports the idea that human status epilepticus commonly is associated with PLEDs, but not predictably as an agonal brain rhythm.

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### References

1. Treiman DM, Walton NY, Kendrick C. A progressive sequence of electroencephalographic changes during generalized convulsive status epilepticus. Epilepsy Res 1990;5:49–60.

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